

## AMENDMENTS TO THE CLAIMS

**Claim 1 (Currently Amended)** An ultra wide band optical transmission system for optically transmitting, via an ultra wide band transmission, one data signal, the ultra wide band optical transmission system comprising:

a pulse train generating ~~portion~~means for converting the one data signal to a short pulse train, the one data signal being converted based on an encoding pattern uniquely predetermined to correspond to the one data signal, and for outputting the short pulse train as an ultra wide band transmission;

a filter portion for (i) one of increasing a pulse width of the short pulse train output from the pulse train generating portion and increasing a rising time and/or falling time of the short pulse train output from the pulse train generating portion, and (ii) outputting a result as the short pulse train;

an optical modulating ~~portion~~means for converting the ~~one~~ short pulse train output from the ~~filter portion~~pulse train generating means to an optically intensity modulated signal and for outputting the optically intensity modulated signal;

an optical transmission path for transmitting the optically intensity modulated signal output from the optical modulating ~~portion~~means;

a pulse compressing portion for (i) receiving the optically intensity modulated signal transmitted on the optical transmission path, (ii) one of compressing a pulse width of the short pulse train which is modulation information, and reducing a rising time and/or a falling time of the short pulse train, by using an interaction between a wavelength chirp and a wavelength dispersion, and (iii) outputting a result as an optical signal;

~~an optical detecting portion means~~ for converting the ~~optical-optically-modulated~~ signal transmitted ~~from the pulse compressing portion-on the optical transmission path~~ to an electrical signal and for outputting the electrical signal; and

~~a data signal extracting portion means~~ for (i) obtaining the short pulse train from the electrical signal output from the optical detecting ~~portion means~~, the short pulse train being obtained based on a decoding pattern that uniquely corresponds to the encoding pattern, and (ii) extracting the one data signal from the short pulse train.

#### Claims 2-15 (Cancelled)

**Claim 16 (Currently Amended)** ~~An~~ The ultra wide band optical transmission system for optically transmitting, via an ultra wide band transmission, one data signal, the ultra wide band optical transmission system comprising according to claim 1, wherein:

~~a the pulse train generating portion means comprises a pulse train generating portion~~ for converting the one data signal ~~to the~~ a short pulse train, ~~the one data signal being converted based on the predetermined an encoding pattern uniquely predetermined to correspond to the one data signal,~~ and for outputting the short pulse train as an ultra wide band transmission;

~~the optical modulating means comprises~~ an optical modulating portion for converting the short pulse train output from the pulse train generating portion to an optically intensity modulated signal and for outputting the optically intensity modulated signal;

an optical transmission path for transmitting the optically intensity modulated signal output from the optical modulating portion;

~~the optical transmission system further comprises~~ a wavelength dispersing portion, which

(i) has wavelength dispersion characteristics, ~~(ii) receives for receiving~~ the optically intensity modulated signal transmitted on the optical transmission path, ~~(iii) compresses for one of~~ compressing a pulse width of the short pulse train ~~or a synthesized signal~~, which is modulation information, ~~or reduces or reducing~~ a rising time and/or a falling time of the short pulse train, by using an interaction between a wavelength chirp and a wavelength dispersion, and ~~(iv) outputs for outputting~~ a result as an optical signal; ~~and~~

~~the optical detecting means further comprises~~ an optical detecting portion for converting the optical signal output from the wavelength dispersing portion to an electrical signal and for outputting the electrical signal; and

a data signal extracting portion for obtaining the short pulse train from the electrical signal output from the optical detecting portion, the short pulse train being obtained based on a decoding pattern that uniquely corresponds to the encoding pattern, and for extracting the one data signal from the short pulse train.

**Claim 17 (Previously Presented)** The ultra wide band optical transmission system according to claim 16, wherein the optical modulating portion uses a directly optical modulation scheme in which a current injected to a semiconductor laser is modulated with a received short pulse train to output an optically intensity modulated signal.

**Claim 18 (Currently Amended)** An ultra wide band optical transmission system for optically transmitting, via an ultra wide band transmission, at least two data signals, the ultra wide band optical transmission system comprising:

a plurality of pulse train generating portions ~~means~~ for converting each data signal to a

respective short pulse train in a predetermined modulation format, each data signal being converted based on a respective encoding pattern uniquely predetermined to correspond to a respective data signal, and for outputting the short pulse trains as an ultra wide band transmission;

a plurality of filter portions for (i) one of increasing a pulse width of each short pulse train output from the pulse train generating portions and increasing a rising time and/or falling time of each short pulse train output from the pulse train generating portions, and (ii) outputting a result as each short pulse train;

a synthesizing portion for outputting an electrical signal obtained by synthesizing a plurality of the short pulse trains output from the plurality of filter portions;

an optical modulating portion-means for converting the electrical signal output from the synthesizing portion-short pulse trains output from the pulse train generating-means to an optically intensity modulated signal-signals and for outputting the optically intensity modulated signal-signals;

an optical transmission path for transmitting the optically intensity modulated signal-signals output from the optical modulating portion-means;

a pulse compressing portion for (i) receiving the optically intensity modulated signal transmitted on the optical transmission path, (ii) one of compressing a pulse width of a short pulse train which is modulation information, and reducing a rising time and/or a falling time of the short pulse train, by using an interaction between a wavelength chirp and a wavelength dispersion, and (iii) outputting a result as an optical signal;

an optical detecting portion-means for converting the optical signal output from the pulse compressing portion-optically modulated signals-transmitted-on-the-optical-transmission-path to

an electrical signal-signals and for outputting the electrical signal-signals; and

a data signal extracting portion-means for (i) obtaining the short pulse trains from the electrical signal-signals output from the optical detecting portion-means, the short pulse trains being obtained based on decoding patterns that uniquely correspond to the respective encoding patterns, and (ii) extracting the data signals from the short pulse trains.

#### **Claims 19-39 (Cancelled)**

**Claim 40 (Currently Amended)** An ~~The~~ ultra wide band optical transmission system for optically transmitting, via an ultra wide band transmission, at least two data signals, the ultra wide band optical transmission system comprising according to claim 24, wherein:

a plurality of pulse train generating portions for converting each data signal to a respective short pulse train in a predetermined modulation format, each data signal being converted based on a respective encoding pattern uniquely predetermined to correspond to a respective data signal, and for outputting the short pulse trains as an ultra wide band transmission;

a synthesizing portion for outputting an electrical signal obtained by synthesizing a plurality of the short pulse trains output from the plurality of filter portions;

the optical modulating portion for converting the electrical signal converts the short pulse trains output from the synthesizing portion-pulse train generating portions to an optically intensity modulated signal and for outputting-outputs the optically intensity modulated signal;

an optical transmission path for transmitting the optically intensity modulated signal output from the optical modulating portion;

~~the optical transmission system further comprises a wavelength dispersing portion, which~~  
(i) has wavelength dispersion characteristics, ~~(ii) receives for receiving~~ the optically intensity modulated signal transmitted on the optical transmission path, ~~(iii) compresses one of~~  
compressing a pulse width of a short pulse train or a synthesized signal, which is modulation  
information, or reduces and reducing a rising time and/or a falling time of the short pulse train,  
by using an interaction between a wavelength chirp and a wavelength dispersion, and (iv)  
outputs for outputting a result as an optical signal; and

~~the optical detecting means comprises an optical detecting portion for converting an the~~  
optical signal output from the wavelength dispersing portion to an electrical signal and for  
outputting the electrical signal; and

a data signal extracting portion for obtaining the short pulse trains from the electrical  
signal output from the optical detecting portion, the short pulse trains being obtained based on  
decoding patterns that uniquely correspond to the respective encoding patterns, and for  
extracting the data signals from the short pulse trains.

**Claim 41 (Previously Presented)** The ultra wide band optical transmission system according to claim 40, wherein the optical modulating portion uses a directly optical modulation scheme in which a current injected to a semiconductor laser is modulated with a received short pulse train to output an optically intensity modulated signal.

**Claim 42 (Currently Amended)** The ultra wide band optical transmission system according to claim 1, wherein a modulation type of a short pulse train converted by the pulse train generating portion ~~means~~ is a pulse position modulation type.

**Claim 43 (Cancelled)**

**Claim 44 (Cancelled)**

**Claim 45 (Currently Amended)** An ultra wide band receiver apparatus for receiving, via an ultra wide band transmission on an optical transmission path, an optically intensity modulated signal modulated with a short pulse train obtained by converging at least one data signal, the short pulse train being obtained based on at least one encoding pattern uniquely predetermined to correspond to the at least one data signal, the ultra wide band receiver apparatus comprising:

a pulse compressing portion for (i) receiving the optically intensity modulated signal transmitted on the optical transmission path, (ii) one of compressing a pulse width of the short pulse train which is modulation information, and reducing a rising time and/or a falling time of the short pulse train, by using an interaction between a wavelength chirp and a wavelength dispersion, and (iii) outputting a result as an optical signal;

an optical detecting portion ~~means~~ for converting the optical ~~optically modulated~~ signal output from the pulse compressing portion ~~transmitted on the optical transmission path~~ to an electrical signal and for outputting the electrical signal; and

a data signal extracting portion ~~means~~ for (i) obtaining the short pulse train from the electrical signal output from the optical detecting portion ~~means~~, the short pulse train being obtained based on a decoding pattern that uniquely corresponds to the encoding pattern, and (ii) extracting the at least one data signal from the short pulse train.